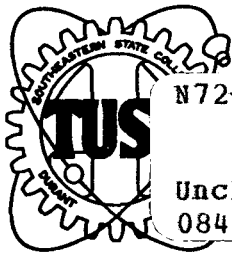


N-72-10988

# TECHNOLOGY UTILIZATION IN A NON-URBAN REGION:

## FURTHER IMPACT AND TECHNIQUE OF THE

### TECHNOLOGY USE STUDIES CENTER (2)



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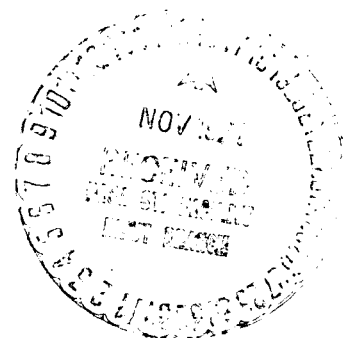
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FINAL REPORT, NSR 37-004-009  
AMENDMENT 1



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### TECHNOLOGY USE STUDIES CENTER

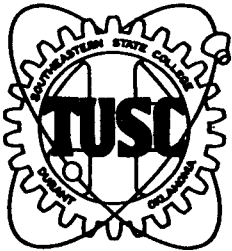
SOUTHEASTERN STATE COLLEGE  
DURANT, OKLAHOMA 74701

MAY 1971

**TECHNOLOGY UTILIZATION IN A NON-URBAN REGION:**

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## ACKNOWLEDGEMENTS

As has been true with prior Annual Reports of the Technology Use Studies Center, the entire staff has in one way or another been involved in the planning and preparation of this report.

There are, however, two persons who deserve special recognition because of their involvement with the detail and written content of the report. They are Bill Dodd, Industrial Specialist, and Mrs. Velma Dittmar, Administrative Assistant and Secretary.

Others deserving mention are A. M. Moore, Senior Industrial Specialist; Leo Thompson, Information Retrieval Assistant; Carol Armstrong, Office Assistant; and Jearl Tipton, Information Retrieval Assistant. Mr. Moore's understanding of the mission of TUSC and Mr. Thompson's diligent searches of the NASA and in-house data bank provided a worthwhile foundation on which to build this report. Miss Armstrong assisted in the preparation of the work copies of manuscript drafts. Mr. Tipton's involvement has been of short duration since he is new at TUSC. He completed tabular preparation and assisted in proofing the final draft of the report.

Cecil Sullivan, Manager of the Southeastern State College Print Shop, has again been helpful in the production of the finished report.

C. Henry Gold

May 1971

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## SUMMARY

This is the Annual Report of the Technology Use Studies Center under NASA Contract, NSR 37-004-009, Amendment 1.

Chapter I updates the clientele served by the Center. One thing that becomes quite clear in this chapter is that TUSC's mission of service to small firms is being fulfilled. Also revealed is that the major impact is certainly within the designated primary service areas. In keeping with a stated TUSC objective, manufacturing leads the list of TUSC client firms. It will also be noticed that the SIC (Standard Industrial Classification) range of these client firms is broad. In addition, it is apparent that substantial numbers of college and university faculties are using TUSC services.

Chapter II relates to field operations inherent in the function of Dissemination and Assistance. Special effort was made throughout the summer of the contract year to cultivate academicians on the college and university campuses in the primary area in Texas. The response has been less than desired but continues to show evidence of impact. Areas of increasing emphasis are apparent among TUSC clientele. They deal with environmental concern and with management. Student use of TUSC resources continued to grow during the contract year.

Chapter III, Faculty Information Service, provides a record of the institutions contacted and the extent of TUSC involvement with them during the contract period. Also mentioned is the experimental Southeastern State College Aerospace Management Course which was offered as a result of the on-campus influence of TUSC personnel.

Chapter IV mentions TUSC's involvement and cooperation with agencies and organizations. The Small Business Administration's use of TUSC services increased during the contract year as a result of the SBA's again having a "technology" field man working within the Southwestern Region. Other agencies mentioned in this chapter include the University of Oklahoma Research Institute, the Southern Oklahoma Development Association, the Cooperative Extension Service, the Soil Conservation Service, the Oklahoma State Forestry Service, and the Oklahoma Aeronautics Commission. TUSC personnel are quite proud of the unsolicited letters contained in Appendix C. They reflect an impact of TUSC and hence the NASA-sponsored Technology Utilization Program on other public agencies.



## CHAPTER I

### UPDATE OF TUSC CLIENTELE

The major thrust of TUSC activities during the past five years relates directly to the task of finding the way and means to ferret out prospective clients and providing technical information as requested by them.

As stated in the 1968 Final Report--the TUSC definition of a client is broad. Any firm or individual with whom the TUSC staff has had an effective interchange and/or to whom TUSC supplied information is regarded as a client.<sup>1</sup> The following statistics are a continuation (or update) of the 1968 data concerning TUSC clients.

Table I provides a record of the steady increase in the number of clients being served. During the 1969-71 time period, an even more evident characteristic of clients is revealed by the tabulation--a large increase in activity with individuals and with cooperating agencies (included in the "Special" column) is shown. In most cases, "Individual" clients are representative of an educational institution; either a faculty member or a student.

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<sup>1</sup>Lee B. Zink, Technology Utilization in a Non-Urban Region: The First Four Years of an Experiment (Durant, Oklahoma: Technology Use Studies Center, Southeastern State College, 1968), p. 16.

TABLE I

## NUMBER OF TUSC CLIENTS BY CLASSIFICATION AND YEAR

<u>Year</u>	<u>Firms</u>	<u>Special*</u>	<u>Individuals</u>
1964	9	--	--
1965	21	--	8
1966	58	--	19
1967	77	--	29
1968**	99	10	68
1969	133	19	100
1970	154	35	136
1971***	164	36	160

\*Includes research organizations and government agencies.

\*\*Four institutions previously classed as firms were moved to the special category this year.

\*\*\*Includes only the period from January 1, 1971 - May 15, 1971.

Table II reflects the size of a typical firm. It is significant that 95% of these firms are classified as small business but even more significant is the fact that approximately 70% of the firms employ less than 50 people. The 1969 Final Report of TUSC's activities indicates that the TUSC Experiment has been geared from its inception to the task of serving primarily the small firms in a non-urban region.<sup>2</sup>

---

<sup>2</sup>C. Henry Gold, Harold Warren, A. M. Moore, Don H. Carpenter and Doyle L. Caton, Technology Utilization in a Non-Urban Region: A Measurement of the Impact of the Technology Use Studies Center (Durant, Oklahoma: Technology Use Studies Center, Southeastern State College, 1969), p. 11

TABLE II

## 1971 TUSC CLIENT FIRMS, BY NUMBER OF EMPLOYEES

<u>Number of Employees</u>	<u>Number of Firms</u>
Below 25	92
25-49	21
50-99	22
100-249	11
250-499	9
<u>500 and over</u>	<u>9</u>
TOTAL	164

The manufacturing type of firm has always been considered by TUSC as the key to economic development of the region.<sup>3</sup> Thus, Table III is a good indicator of the primary thrust of the TUSC effort.

TABLE III

## COMPOSITION OF TUSC CLIENT FIRMS, BY TYPE OF FIRM, 1971

<u>Item</u>	<u>Number</u>
Services	37
Mining	3
<u>Manufacturing</u>	<u>124</u>
TOTAL	164

---

<sup>3</sup>Ibid., p. 29.

The geographic location of clients is shown in Table IV, and Table V sets forth a two digit Standard Industrial Classification (SIC) for the manufacturing firms that are TUSC clients.

TABLE IV

1971 TUSC CLIENTS BY GEOGRAPHIC LOCATION

	<u>Firms</u>	<u>Individuals</u>	<u>Special</u>
*Nineteen Counties	102	110	22
Remainder of Oklahoma	45	23	7
**Fifteen Counties	3	14	1
Remainder of Texas	6	7	3
<u>Other States</u>	<u>8</u>	<u>7</u>	<u>3</u>
TOTAL	164	161	36

\*Garvin and Ponotoc Counties in Oklahoma were added in June 1968.

\*\*Fifteen counties of Northeast Texas were added in May 1969.

These counties were: Bowie, Cass, Collin, Cooke, Delta, Denton, Fannin, Franklin, Grayson, Hopkins, Hunt, Lamar, Morris, Red River and Titus.

Appendix A is a map showing the TUSC Project Area.

TABLE V

## MANUFACTURING FIRMS BY SIC CLASSIFICATION\*

<u>Two Digit SIC Classification</u>	<u>Number of Clients</u>
13 Crude Petroleum and Natural Gas	2
19 Ordnance and Accessories	0
20 Food and Kindred Products	6
22 Textile Mill Products	1
23 Apparel and Other Finished Products Made from Fabrics and Similar Materials	4
24 Lumber and Wood Products, except Furniture	5
25 Furniture and Fixtures	4
26 Paper and Allied Products	3
27 Printing, Publishing and Allied Products	2
28 Chemical and Allied Products	4
29 Petroleum Refining and Related Industries	4
30 Rubber and Miscellaneous Plastic Products	10
31 Leather and Leather Products	1
32 Stone, Clay and Glass Products	12
33 Primary Metal Industries	3
34 Fabricated Metal Products, except Ordnance, Machinery and Transportation Equipment	19
35 Machinery, except Electrical	32
36 Electrical Machinery, Equipment and Supplies	12
37 Transportation Equipment	11
38 Professional, Scientific and Controlling Instruments: Photographic and Optical Goods; Watches and Clocks	9
39 Miscellaneous Manufacturing Industries	11

\*Total will not equal 124 because some firms have more than one manufacturing classification.

To supplement the client information as previously set forth, the following table provides a more comprehensive listing of TUSC clients and completed searches (and/or information requests). The dissemination and assistance service provided during the past year is included in Chapter II. Requests for non-technical information are included in the "Number of Searches" column; therefore, the total number of searches reflected therein will not total the completed searches reported in Appendix B.

TABLE VI

## RECIPIENTS OF TUSC SERVICE

<u>Classification of Recipient</u>	<u>Number of Recipients</u>	<u>Number of Searches</u>
Firms	164	333
Individuals:		
Southeastern State College	62	75
East Central State College	8	15
Oklahoma State University	7	16
University of Oklahoma	1	4
Other Oklahoma Colleges	8	32
Texas Colleges	12	14
Other Colleges	3	3
Other Individuals	60	75
<u>Special</u>	<u>36</u>	<u>89</u>
TOTAL	361	656

## CHAPTER II

### DISSEMINATION AND ASSISTANCE

...dissemination and assistance service shall be provided in a manner designed to bring about the utilization of NASA-generated technology by recipients and to promote a better understanding of the process by which such technology is made available... (Statement of Work, NASr-009)

#### Introduction

The philosophy which continues to influence the TUSC Dissemination and Assistance function is set forth in previous annual reports and is summarized in NASA Contractor Report 1763,

"It will surprise no one that the single most important factor in effective technology transfer is the personality of the TUSC field man. If he cannot effectively communicate with his client, the process of transfer never begins. When our field man makes his first call on a prospective client, he has done much preliminary work to familiarize himself with the client's problems. He takes along NASA literature with specific appeal to the client's interests. Many times, the potential client indicates virtually no interest during the first encounter. Then, surprisingly, he may call the next week asking for help in solving a specific problem. If that doesn't happen, the field man may find the next time he calls, a desire for assistance. Obviously, there is no real pattern in technology transfer."<sup>1</sup>

---

<sup>1</sup>John Geise, "The Role of the Regional Dissemination Centers in NASA's Technology Utilization Program," NASA Contractor Report, NASA CR-1763 (Washington, D.C.: National Aeronautics and Space Administration, May 1971), p. 94.

With one exception, the TUSC field work accomplishments have been performed as mentioned in the reference--this exception refers to the expanded "Project Area" as set forth in the Contract Work Statement. The TUSC project area now includes 15 Northeast Texas counties as well as the 19 Southeastern Oklahoma counties. There are 10 universities/colleges located in the Texas territory assigned to TUSC. These institutions have been cultivated in the belief that they will become "centers of influence" for the task of technology dissemination and assistance; furthermore, they should provide many on-campus clients for TUSC. The following is a summary of TUSC's experience in this effort.

#### Field Operations

Throughout the summer of 1970, a special effort was made to establish contacts on all college campuses in TUSC's designated area. Usually the first to be contacted was the college librarian, since library personnel are most likely to know about significant research projects of which a literature search is involved. Also, the librarian routinely knows staff personnel who are consistent users of the library. In some cases, the college president was personally contacted and usually the chairman of the sciences department was contacted. In each and every case, the TUSC representative was well received; and in almost every instance, a high level of enthusiasm about the TUSC services was noted. Following these visits, the TUSC Director corresponded with each college president to express appreciation for the hospitality extended and especially for the college personnel's interest in the TUSC



technical library. As follow-up action, "newsletter" type information was sent to the various college personnel visited-- this was to serve as a reminder of the NASA technology data bank that is available to the college and to provide additional information about how the services of TUSC could be utilized.

To date, this experiment has not produced the results nor reached the expectations of TUSC personnel. In other words, the amount of effort expended in cultivating clients through college contacts seemingly has not produced a comparable result in terms of large numbers of search requests. However, Table I, page 2, does reflect favorably in that a large increase in clients in this category is notable over the past two years. It would also be premature to conclude that the effort was futile because the history of the TUSC "Experiment" is full of examples where clients do not respond immediately. The introduction section of this chapter discusses the philosophy of the TUSC dissemination and assistance function--certainly the non-reaction by these college personnel is consistent with past experience.

From a positive point of view, the record of overall TUSC activity with college personnel indicates an appreciably increased level of interest. For instance, Southeastern Oklahoma State College's increase stems directly from an increased awareness and knowledge on the part of both students and instructors as to the vast amount of research information available through TUSC. Also, it has resulted in part through the activity of a former State Technical Service Field Representative associated with TUSC, who is now a faculty member of East Central Oklahoma State College.

Search 537 was the last of 115 searches completed during the contract year. An analysis of this search effort as compared with that of the previous contract year is somewhat complicated by the fact that the TUSC search effort in the previous year involved the Oklahoma State Technical Services (STS) program which was not performed through TUSC this year. Therefore, in the interest of clarification, the number of TUSC searches completed during the previous year were 59; STS searches completed were 87. It is also significant to point out that search requests relating to the STS program originated outside the TUSC geographical area.

Two prime areas of interest have been noted by the TUSC information retrieval team: (1) environmental concerns and (2) management interests. The national emphasis on environmental pollution and general alarm resulting therefrom has served to motivate more search requests on the subject than ever before. Coordinated academic activities at Southeastern Oklahoma State College involving the Aviation and Business Departments resulted in the development of an aerospace management course. Management reference material in the TUSC data bank was used by students as an additional research source. The use of the TUSC technical library by these students has helped to create an awareness of the wealth of information available through TUSC, and this new awareness has brought other search questions to the Center.

Appendix B is a chronological listing of the searches accomplished during the contract year. Listed in Appendix C are two unsolicited letters that relate to the impact of TUSC services during this report period. In their way, they communicate a further impact of NASA-sponsored research dissemination.

### CHAPTER III

#### FACULTY INFORMATION SERVICE

The "dissemination and assistance" service discussion in the previous chapter includes special mention of TUSC's extra effort to cultivate the staff and faculty representatives of educational institutions in the primary area. Thus, the purpose of this chapter is to set forth a record of the institutions contacted and show the extent of TUSC involvement.

Also, a detailed discussion of the Southeastern State College Aerospace Management Course is included in Chapter IV of this report. This experimental course served a multi-purpose objective in that it was a very fine "elective" course for aviation and business students, and it has proved to be a highly productive vehicle as a TUSC public relations medium. There were 140 students enrolled in the course and many of them have become consistent users of the data bank--they are also doing a good job of indoctrinating other people about the services available through TUSC. Twelve formal searches have been completed for students and/or staff members of which more than 53% originated from the management course. After students and staff members became acquainted with the diversity of material in the data bank, the volume of requests became burdensome for the TUSC retrieval staff; therefore, innovation was a matter of necessity. The Retrieval

Specialists began to provide search guidance for students so that they could conduct their own searches. Reading tables and microfiche readers were provided. Those students who were familiar with the system would then select the abstracts they considered pertinent to their need, and the TUSC personnel would retrieve the microfiche report. Occasionally, a paper copy of a microfiche chart or draft was requested; but in most cases, the microfiche were not developed in paper copy form and the microfiche reports seldom left the TUSC library. It is estimated that 60 "searches" have been accomplished in the manner described above.

A TUSC service (as indicated) has been made available to each of the educational institutions listed below:

<u>Institution</u>	<u>Service</u>
Southern Oklahoma Area Vo-Tech School, Ardmore	Campus visit
Cooke County Junior College, Gainesville, Texas	Searches & visit
East Central State College, Ada, Oklahoma	Searches & visit
East Texas State University, Commerce, Texas	Search & visit
Grayson County Junior College, Sherman, Texas	Search & visit
Kiamichi Area Vo-Tech School, Hugo, Oklahoma	Campus visit
Kiamichi Area Vo-Tech School, McAlester, Oklahoma	Campus visit
Kiamichi Area Vo-Tech School, Poteau, Oklahoma	Campus visit
North Texas State University, Denton, Texas	Searches
Oklahoma State University, Stillwater, Oklahoma	Searches
Oklahoma Vocational Rehabilitation School Stringtown, Oklahoma	Search & visit
Paris Junior College, Paris, Texas	Campus visit
Southeastern State College, Durant, Oklahoma	Searches
Southern Oklahoma Skill Center, Sulphur, Oklahoma	Search & visit
Spartan's School of Aeronautics, Tulsa, Oklahoma	Search
Texarkana Junior College, Texarkana, Texas	Search & visit
University of Arkansas, Fayetteville, Arkansas	Presentation
University of Oklahoma, Norman, Oklahoma	Searches
University of Texas at Arlington, Texas	Search
University of Tulsa, Tulsa, Oklahoma	Searches

## CHAPTER IV

### COOPERATION WITH OTHER AGENCIES

The Contractor shall continue to work closely with and attempt to develop new cooperative efforts with...public and private organizations and institutions concerned with promoting the economic and technological development of the region. (Statement of Work, NASr-009)

This chapter is an extension of Chapters II and III; however, the purpose here is to report TUSC's involvement and cooperation with the specific agencies or organizations per Article I, par. D, of the contract.

#### Small Business Administration

The Regional Office for the Small Business Administration (SBA) is located in Dallas, Texas. Due to an organizational change in the SBA, their "Industrial Specialist" type of field man position was not provided for during a six-month period in 1970; however, the SBA Office continued to receive more and more queries as a result of the efforts of their previously assigned "technology" field man, Mr. Bruce Gipson (see TUSC's QSR #24). Therefore, in February 1971, the SBA established a new position for a technology field representative and placed an employee in a part-time duty situation to cover the region's five state area (his other duties are not related to technology dissemination).

TUSC has an excellent relationship with the SBA which is a credit to not only the present field man but to his predecessor as well--both of these men have expressed a deep appreciation for the ready access they have to the TUSC data bank. Requests for information from the SBA part-time field representative have averaged one or more searches per month.

#### University of Oklahoma Research Institute

The University of Oklahoma Research Institute has been a continuing client of this Center since the foundation of TUSC. A current research project has to do with the hazard of raw fuel in the fuel tank of automobiles when a serious accident occurs. During the early years of TUSC's existence, searches were performed for the Institute on the hazards of the fuel supply in an airplane crash--many references and citations are common to both of these search requests.

#### Southern Oklahoma Development Association

This organization, locally known as SODA, has a fine record as a technical advisor and executor for federal programs of a ten-county Oklahoma area. Currently, SODA's effort is to upgrade law enforcement capabilities, health services, and municipal services within the cities and rural areas of the region. The involvement of TUSC has been to provide SODA information concerning economic history data and technical literature searches have been performed. For example, one search request concerned the feasibility of establishing a facility to manufacture welding gas in the SODA area--to date no move has been made to establish such a facility.

### Cooperative Extension Service

County 4-H Club Extension Agents in the TUSC primary area were contacted in an attempt to cultivate additional "centers of influence" for technology utilization. The 1971 4-H Camping Program in McCurtain County was expanded to a Tri-County 4-H Camp--it included Pushmataha and Choctaw Counties, and the camp theme was "Space and Mankind." The Manned Spacecraft Center provided TUSC with 22 aerospace films to be used as audiovisual aids in support of the camp theme and educational program. Also, pollution study material and references were made available to 4-H Clubs as the subject was designated as a topic for emphasis during the year.

### Soil Conservation Service

The Soil Conservation Service Area Office and 12 Field Offices are located in the TUSC primary area. In September 1970, a meeting was held with the Area Conservationist in Hugo, Oklahoma, at which time information concerning NASA's technology dissemination and assistance service was presented for further dissemination to the various field offices. Because the agency is deeply involved in pollution control, and land planning related thereto, the TUSC data bank is proving to be useful to this particular Department of Agriculture agency.

### Oklahoma State Forestry Service

As a result of a field visit and contact with a Forestry Service Agent, TUSC provided information that was requested on

engineering safety. The Forestry Service receives numerous requests to participate in various seminars, and the information was to be used in connection with Forestry Service meetings and seminars during the year. Information about the availability of technology assistance was provided also.

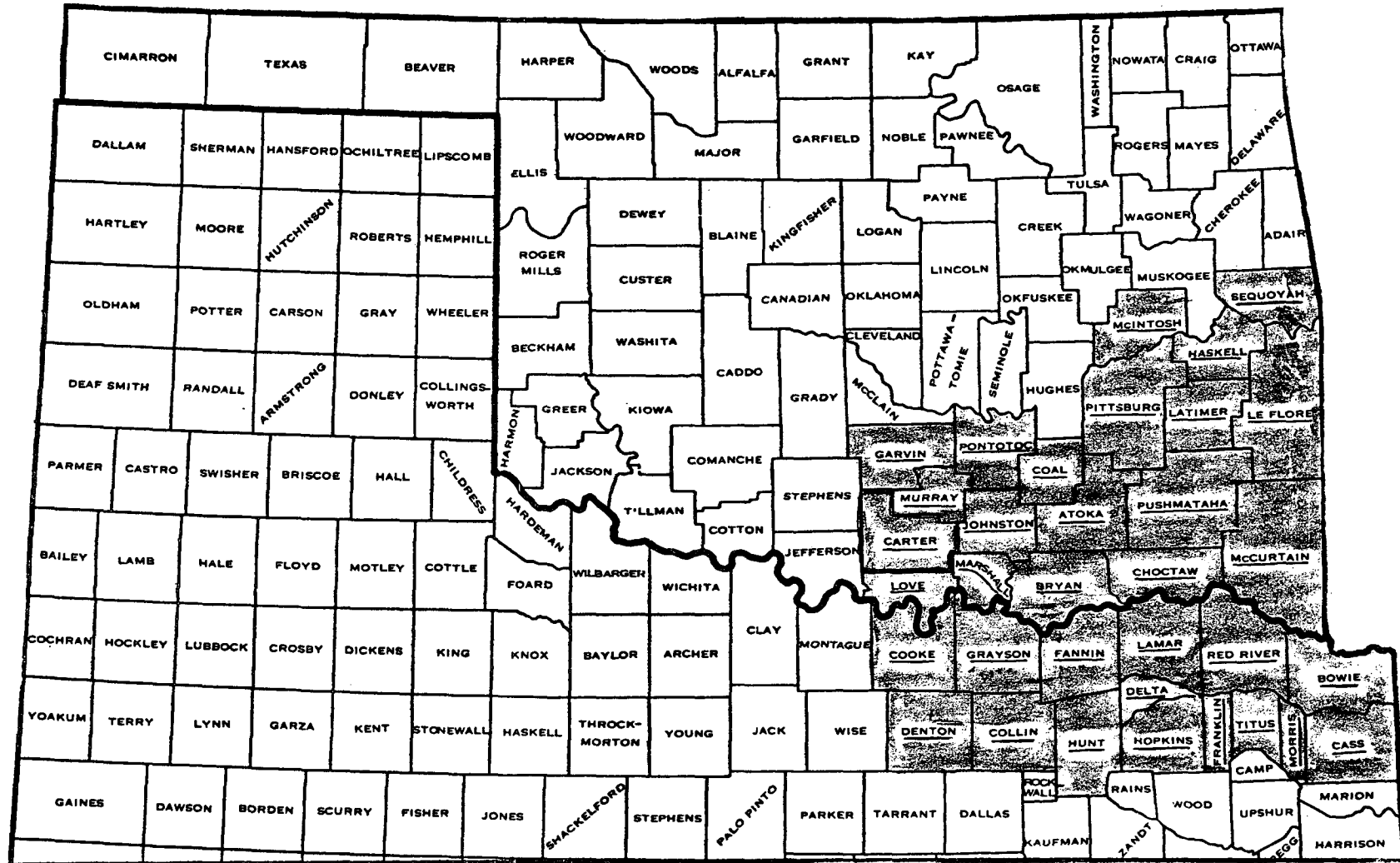
#### Oklahoma Aeronautics Commission

TUSC coordinated a joint effort that was essential to the success of a two-semester hour "Aerospace Management" course conducted on campus in the Fall of 1970. The Oklahoma Aeronautics Commission's Education Advisory Committee cooperated with TUSC in providing a way and means for the prestige of the Governor's Office to be effectively utilized in making the course a success. This course was approved and academically sponsored by the Aviation and Business Departments after originally being conceived by TUSC; it consisted of eight four-hour class meetings. The seminar was opened by a fine presentation by LTV's Mr. Ed L. Johnson at which time he discussed "Program Management." Other speakers covered in detail the broad outline presented in the opening meeting of the course. NASA's TU Division made available the services of Mr. Joseph M. Carlson who discussed "Aerospace Management Technology: Public and Private Sector Applications." The course was well received by students and professors as well as the Oklahoma Aeronautics Commission and the Governor's Office. Visiting "instructors" received a letter of appreciation from the Governor for their participation in the program.

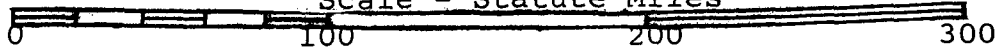


APPENDIX A  
TUSC PROJECT AREA

# TUSC PROJECT AREA



Scale - Statute Miles



APPENDIX B

SUMMARY CHARACTERISTICS OF TUSC TECHNICAL SEARCHES

# SUMMARY CHARACTERISTICS OF TUSC TECHNICAL SEARCHES

SEARCH NUMBER	SEARCH SUBJECT	SIC	CLIENT	LOCATION OF CLIENT
423	Effect of noise on animals.	I-S	S. J. Truby	Durant
424	Training of medical technicians.	I-T	Jim Adcock	Durant
425	Training of nurses.	I-F	Texarkana Junior College	Texarkana, Texas
426	Technology education.	I-S	Guy Strunk	Ada
427	Aluminum welding techniques.	I-O	Coolage Wann,Wann Welding	Poteau
428	Reliability of spacecraft environmental control.	I-O	Jimmy Johnson	Poteau
429	State-of-the-art in turbine (Jet) engines for generating electricity.	35	Woodrow Turman, Jr. Poteau Trucking Company	Poteau
430	Engineering safety.	I-O	Bennie Wood	Heavener
431	The economic characteristics of Bryan County.	I-T	Jim Adcock	Durant
432	State-of-the-art on cleaning large volumes of of water.	I-O	Wendell Hale	Caddo
433	Training program for machine operators.	23	Guy Traylor White Stag Manufacturing Co.	Checotah

I-S -- An individual student.

I-T -- Any individual who is working in technology research for a government agency.

I-F -- An individual faculty member.

I-O -- Any other individual who is not employed by a manufacturing firm, agency, or a school system.

NOTE: Unless otherwise indicated, client is located in the State of Oklahoma.

SEARCH NUMBER	SEARCH SUBJECT	SIC	CLIENT	LOCATION OF CLIENT
434	Curing time for perma-press material.	23	Guy Traylor, White Stag Mfg. Co.	Checotah
435	State-of-the-art for microfilm reader.	I-T	John Grigsby	McAlester
436	Pollution information for high school level.	I-T	John Grigsby	McAlester
437	Inland waterway pollution problem.	I-F	Dr. Frank Wade	Durant
438	Information on manning an airport.	I-T	John M. Thompson III	Arlington, Texas
439	Economic feasibility of manufacturing welding gases.	I-O	Armon M. France Main Automotive	Madill
440	Aviation administration (airport management).	I-F	Edith Anderson	Dayton, Ohio
441	Joining ceramics.	36	David P. Studer Arkansas Power and Light Co.	Little Rock, Arkansas
442	Hole drilling in ceramics.	I-O	Vernon McKinley	Marietta
443	Repeat of search #436.	I-O	Bob Farabough	Pauls Valley
444	Special NASA publications suitable for Vocational Education classes.	I-F	Dr. Harold Brenholtz	Ada
445	Information relating to soil conservation.	I-T	John C. Beard	Hugo
446	Information about safety, quality control techniques, and the TUSC data bank.	36	G. E. Laningham North American Rockwell Corp.	McAlester
447	Transmitter telemetry, "S" and "L" band UHF.	36	Frank Rose, Okla. Aerotronics	Hartshorne
448	Oscillator, variable frequency (stable).	36	Frank Rose, Okla. Aerotronics	Hartshorne

SEARCH NUMBER	SEARCH SUBJECT	SIC	CLIENT	LOCATION OF CLIENT
449	Repeat of search #435.	I-F	Ray Kelly	Hugo
450	Information about industrial safety.	I-O	Tom Bagwell, Brown & Root	Valliant
451	Oscillator, voltage control crystal (VCXO).	36	Frank Rose, Okla. Aerotronics	Hartshorne
452	Frequency synthesizers,digital,integrated circuits.	36	Frank Rose, Okla. Aerotronics	Hartshorne
453	Request--NASA's film catalog.	I-T	Grant Praytor	Idabel
454	Multipliers--step recovery or high order.	36	Frank Rose, Okla. Aerotronics	Hartshorne
455	State-of-the-art in the basic methodology of Education Taxonomy.	I-F	C. Henry Gold	Durant
456	State-of-the-art in thermal electrical cooling.	I-F	Ray Glover	Stringtown
457	State-of-the-art in polyurethane fabrication.	I-T	Dwight A. Roberts	Maysville
458	State-of-the-art in insulation.	35	William Hood,Blackwell Steel	Blackwell
459	Transponder, ATC, IFF.	36	Frank Rose,Okla. Aerotronics	Hartshorne
460	Literature pertaining to technical writing.	I-F	Mrs. Pat Condor	Ada
461	Earthbound uses for space photography.	I-F	Professor Kelly	Ada
462	Important factors affecting industrial safety.	37	John Laverman, Lockheed Co.	McAlester
463	State-of-the-art in non-destructive testing.	I-F	Bill Cotter	Tulsa
464	Information on pollution and environmental qualities.	I-F	Mrs. Karynn Bahner	Davis
465	Repeat of search #456.	I-O	W. D. Manahan Stone's Propane and Appliance	Durant

SEARCH NUMBER	SEARCH SUBJECT	SIC	CLIENT	LOCATION OF CLIENT
466	State-of-the-art in metal forming.	34	Bruce L. Miles Vega Enterprises, Inc.	Decatur, Illinois
467	State-of-the-art in industrial adhesives	I-T	M. J. Ruley	Tulsa
468	Information about the functions of the National Labor Relations Board.	I-S	James Mansfield	Durant
469	Time and motion studies in offices.	I-S	Ed Powers	Durant
470	Metal fatigue in stainless steel.	26	C. J. Hibbler, Solo Cup Co.	Ada
471	Environmental pollution causes.	I-F	Doyle L. Caton	Ada
472	Information relative to the qualification requirements for a securities exchange license.	31	John C. Simpler Corral Sportswear	Ardmore
473	State-of-the-art in laser welding.	I-F	Bill Gaither	Durant
474	Information on commercial uses of air photography.	I-F	Doyle L. Caton	Ada
475	Information on writing proposals.	I-F	Pat Condor	Ada
476	Information on the harm of sonic booms to structures.	I-S	Rodney Bragg	Durant
477	Information on air pollution.	I-F	Doyle L. Caton	Ada
478	Wake turbulence or wing tip vortex.	I-S	Jan O. Randle	Durant
479	Information on the baking industry and related vocational training.	I-F	Ray Glover	Stringtown
480	Electrical test systems--information on servo motors and miniature polyphase-motor field assemblies.	38	Elmer Slaughter Slaughter Company	Ardmore

SEARCH NUMBER	SEARCH SUBJECT	SIC	CLIENT	LOCATION OF CLIENT
481	The relationship between "noise" and employee work efficiency.	I-O	Tom Bagwell Brown and Root, Inc.	Valliant
482	State-of-the-art in environmental control.	I-F	Ray Glover	Stringtown
483	NASA contributions to design and drafting.	I-F	Ray Glover	Stringtown
484	NASA material suitable for radio and TV training.	I-F	Ray Glover	Stringtown
485	State-of-the-art in welding.	I-F	Ray Glover	Stringtown
486	Material suitable for astronomy course on Quasars.	I-F	Paul D. Thomas	Gainesville, Texas
487	Material suitable for astronomy class on Neutron Stars.	I-F	Paul D. Thomas	Gainesville, Texas
488	State-of-the-art in refrigeration/air conditioning systems.	35	Wayne Smith Governair Corporation	Oklahoma City
489	Stroboscope developments for printing press equipment--used to insure accuracy of color in printing.	38	Elmer Slaughter Slaughter Company	Ardmore
490	Development of electrical test systems for checking printed circuit boards.	38	Elmer Slaughter Slaughter Company	Ardmore
491	Information on measures used to control malaria in Vietnam.	I-F	James Crump	Gainesville, Texas
492	Information on communications with dolphins.	I-S	Carol Armstrong	Durant
493	Destructive and/or non-destructive test procedures used by aerospace equipment producers.	I-F	Elmer King	Durant



SEARCH NUMBER	SEARCH SUBJECT	SIC	CLIENT	LOCATION OF CLIENT
494	Stopping distance as affected by runway conditions.	I-F	Elmer King	Durant
495	Repeat of search #435.	I-F	Doyle L. Caton	Ada
496	Information on locating metal objects in tissue.	36	Frank Rose, Okla. Aerotronics	Hartshorne
497	Information on air pollution.	I-F	Dr. B. J. Tillman	Ada
498	General information on Pulsars.	I-F	Paul D. Thomas	Gainesville, Texas
499	Information in the comparison of the characteristics of liquid and solid rocket propellants.	I-F	Ray Glover	Stringtown
500	Information on a "speed" agent used to accelerate the curing time for concrete.	20	Paul Sergeant Hickory King Enterprises	Antlers
501	Requested technical assistance and advice on ways to improve the design of the "Haul-a-Bike" tie-down bracket by the use of metal/s of lighter weight.	35	Gene Hill Haul-a-Bike Manufacturing, Co.	Antlers
502	Heterotrophic growth of blue-green algae.	I-F	Gary Lawley	Denton, Texas
503	State-of-the-art in fluidics.	32	Wendell Hale	Caddo
504	State-of-the-art in corrosion control.	I-F	Doyle L. Caton	Ada
505	State-of-the-art in miniature transducers.	I-O	Lawrence DeLay, Park's Drug	Ardmore
506	Engineering characteristics of foam concrete.	20	Paul Sergeant Hickory King Enterprises	Antlers
507	High speed and "G" forces on the human body.	I-F	Ray Glover	Stringtown

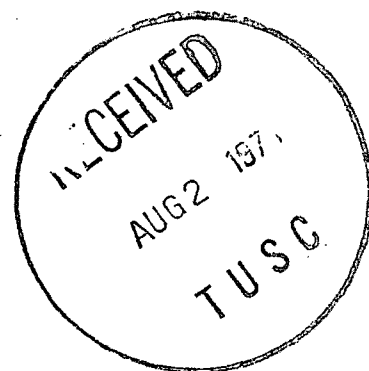
SEARCH NUMBER	SEARCH SUBJECT	SIC	CLIENT	LOCATION OF CLIENT
508	Dangers associated with too frequent blood withdrawals.	I-F	Ray Glover	Stringtown
509	Engineering characteristics of honeycomb structures.	I-T	S. Charles Pierce, SBA	Dallas, Texas
510	Requested economic data on Pontotoc County.	25	Jack Orr, Kirkpatrick Co.	Ada
511	State-of-the-art on heating pipes.	I-O	Jeff Cox, JEFECO	Tishomingo
512	Comparison of plastic pipe material with metal pipe for use in household plumbing.	I-F	Doyle L. Caton	Ada
513	State-of-the-art in industrial adhesives.	25	Jack Orr, Kirkpatrick Co.	Ada
514	Man/machine relations.	25	Jack Orr, Kirkpatrick Co.	Ada
515	Application of wood pulp and paper in pre-fab construction.	25	Jack Orr, Kirkpatrick Co.	Ada
516	Bearing operation in dust environment.	I-O	Dean Miller	Denison, Texas
517	Information on computation of time-loss by accidents.	I-O	Tom Bagwell Brown and Root Inc.	Valliant
518	The effect of forest fires on the ecology.	24	M. H. Burk, Weyerhaeuser Co.	Broken Bow
519	Information on personnel motivation in industry.	34	W. E. Anderson, Clayton & Co.	Sherman, Texas
520	Information on determining "cost effectiveness."	25	Jack Orr, Kirkpatrick Co.	Ada
521	State-of-the-art in film reliability.	I-T	S. Charles Pierce, SBA	Dallas, Texas
522	Determination of air speed with pitot-static system.	I-S	Dennis Campbell	Durant

SEARCH NUMBER	SEARCH SUBJECT	SIC	CLIENT	LOCATION OF CLIENT
523	State-of-the-art in fuel cells.	30	Augie Doner Perfection Plastics, Inc.	Durant
524	State-of-the-art in drafting techniques.	I-F	Bob Ray	Durant
525	Welding stainless steel tubing.	I-T	S. Charles Pierce, SBA	Dallas, Texas
526	State-of-the-art in integrated circuits.	I-S	Edward B. Collins	Sherman, Texas
527	Commercial time/count control.	38	Elmer Slaughter, Slaughter Co.	Ardmore
528	Pressure sensitive labels.	38	Elmer Slaughter, Slaughter Co.	Ardmore
529	State-of-the-art in boron and graphite composites.	I-T	S. Charles Pierce, SBA	Dallas, Texas
530	State-of-the-art in electrical quick disconnect connectors.	38	Elmer Slaughter, Slaughter Co.	Ardmore
531	Fabrication of steel cabinets.	38	Elmer Slaughter, Slaughter Co.	Ardmore
532	Glass reed electrical switches.	38	Elmer Slaughter, Slaughter Co.	Ardmore
533	State-of-the-art in voltage control regulators.	38	Elmer Slaughter, Slaughter Co.	Ardmore
534	Information on measuring vibrations of a rotating wing.	35	Donald O'Dell Chittom Equipment Co.	Tulsa
535	Theory of harmonic vibration.	35	Donald O'Dell Chittom Equipment Co.	Tulsa
536	Hydrogen hazards.	34	W. E. Kottwitz Anderson, Clayton, & Co.	Sherman, Texas
537	Surface corrosion control.	34	Mr. McCord Anderson, Clayton, & Co.	Sherman, Texas

APPENDIX C

UNSOLICITED LETTERS RELATED TO TUSC SERVICES

U. S. GOVERNMENT  
SMALL BUSINESS ADMINISTRATION  
REGION VI  
1100 COMMERCE STREET  
DALLAS, TEXAS 75202  
214/749-2218



JUL 30 1971

Dr. C. Henry Gold, Director  
Technology Use Studies Center  
Southeastern State College  
Durant, Oklahoma 74701

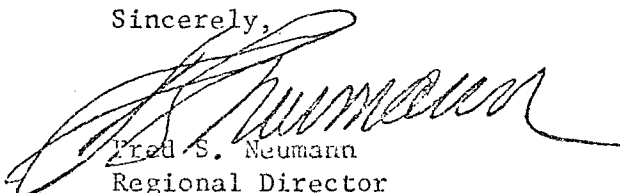
Dear Dr. Gold:

Although Mr. Charles Pierce, Technology Utilization Officer for this Region of the Small Business Administration, has been employed less than six months, we have been advised by Mr. Forrest Decker, Chief, Technology Utilization Division, Central Office that our Technology Utilization Program compares favorably with the others around the country. We feel that the attainment of this level of proficiency in such a complex field could not have been attained without the support and cooperation of technical information sources such as yours.

At this time I wish to express the appreciation of the Small Business Administration, both at the Washington Central Office level and for this Region, for the sincere and efficient efforts of your staff in assisting Mr. Pierce to establish the Technology Program in our five state area. Mr. Pierce feels that Mr. Augie Moore and his assistants have gone far beyond their responsibility in making beneficial suggestions as to related topics on the literature searches which have resulted in expeditious technology transfer. Too, literature searches received have been superior to those from other search sources due to their covering the latest "state of art" and containing abstracts of reports/data with the bibliography rather than mere subject titles and authors.

We hope that every effort will be made to continue the service which you provide and if the Small Business Administration can be of assistance to you in any of its Programs, we would welcome your inquiry.

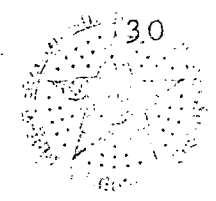
Sincerely,



Fred S. Neumann  
Regional Director

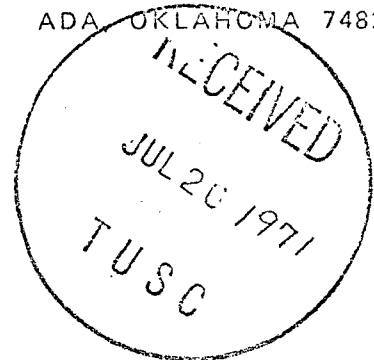


# OKLAHOMA ENVIRONMENTAL INFORMATION AND MEDIA CENTER



EAST CENTRAL STATE COLLEGE • PHONE 405/332-8000 • ADA OKLAHOMA 74820  
July 16, 1971

Dr. C. Henry Gold  
Technology Use Studies Center  
Southeastern State College  
Durant, Oklahoma



Dear Henry,

In reviewing the past year, it seems that the only time I have been in contact with you and the TUSC staff, was when I wanted information or assistance. I think it's about time I extended my thanks and appreciation for your service.

I am not sure just how many times we called on TUSC for assistance this past year, but I do know that information provided by TUSC contributed significantly to the projects with which I was involved. We used the information on noise pollution on several occasions. It was particularly useful in the development of our Oklahoma Environmental Control Action Plan.

Another area in which we have benefited from TUSC influence is that the newly established environmental information center will apply NASA techniques in the accumulation, storage and dissemination of state generated ecological data. Without the TUSC-NASA influence, we might well be still searching for an effective method of handling the state data.

Once again, I extend my own personal appreciation and that of the School of Environmental Science for your excellent service.

Sincerely,

Doyle A. Caton  
School of Environmental Science  
East Central State College

DLC/tc